

# **APPENDIX A**

**Gregory Jerome Kintz**

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Technology and product development for medical devices, biotechnology, and lasers systems.

**Major product developments include:** The ARES Surgical Robotic platform for Auris, The DNA detection platforms, GeneXpert and SmartCycler, for Cepheid, the OEM micro-display subsystem for Inviso, and the injection seeder for Spectra-Physics

**Skills:**

*New Technology Development*

Camera systems for endoscope, vision systems and cellular telephones with custom image processing systems. Fluorescence detection systems for biotechnology. Laser radar systems design and application development. Nanoparticle technology for biotechnology applications.

*Project Management*

Technical Director of a Robotic Cart development program. Principle Investigator of SBIR Program on a multiphoton imaging system. Technical Director of DARPA contract for new micro-fluidics technology.

*Intellectual Property*

Development of patents for new concepts, participated in over 30 issued patents

*Computer Experience and Tools*

Tools: Zemax, C/C++, Python, Java, OpenCV, ImageJ, Office

**Work Experience:**

**2005-present Mount Mitchell Optics, Santa Cruz, CA Senior Consultant**

Consulting in the development of new optical technology. Design of optical systems for scanning retinal photo-coagulators including complex zoom systems and aspheric lens systems. Application of Laser Radar systems to equipment placement is robotic equipment set-up. Numerical modeling of light propagation in tissue. Development of miniaturized camera systems for cellular telephones. IR Sensor analysis

**2012-2016 Auris Surgical Robotics, Redwood City, CA Director of Vision Systems**

Development of robotic endoscopy and microsurgery systems. Development of camera systems, custom image processing systems, electro-magnetic sensor systems, micro laser tools, optical coherence tomography imaging systems, and stereo video visualization systems.

**2011-2012 PROFUSA, San Francisco, CA Senior Director of Optical Engineering**

Development of new optical technology for glucose sensing. Design and development of compact optical system for detection of trans dermal optical fluorescence signals.

**2009-2012 Laser Biopsy Inc., Asheville, NC Founder and Vice President of Engineering**

Development of new multi-photon microscopy technology for tissue imaging. Principle Investigator of SBIR Program. System hardware development, software development and system testing. Grant development. Product technology roadmap development

**1998-2005 Cepheid, Sunnyvale, CA Director Optical and Electrical Engineering**

Management of optical and electrical staff. New product research and development in an ISO and FDA environment. Development of the GeneXpert and SmartCycler platforms.

Previous product development and research at InViso, Lockheed Missiles and Space Company, Spectra Physics, Naval Research Laboratory, the University of Colorado, Boulder, and Georgia Tech

30 Issued Patents and Numerous Publications and Conference Presentations

**Education:** Masters of Science in Physics, University of Colorado, Boulder, CO  
B.S. in Physics with Highest Honor, Georgia Institute of Technology, Atlanta, GA

## **Detailed Work Experience:**

### **2005-2012 Mount Mitchell Optics** *Optical Engineering Consultant*

Consulting in the development of new optical technology. Application of Laser Radar systems to equipment placement is robotic equipment set-up. Design of laser systems for ophthalmology. Design of complex zoom systems and aspheric lens systems. Development of miniaturized camera systems for cellular telephones using Zemax and Code V. Development of custom image processing algorithms for miniaturized cameras using ImageJ. Development of custom search algorithms for new camera designs. Analysis of opto-mechanical tolerances for camera systems. Stray light analysis using non-sequential optical models. Analysis of solar algae growth chambers. IR detector subsystems for computers. Market analysis of ultra-fast lasers and accessories.

### **2012-2016 Auris Surgical Robotics** *Director of Vision Systems*

Management of multi-arm robotic cart development for a Non-Significant Risk study in endoscopic applications. Development new camera systems including micro cameras for endoscopy and high resolution, low latency imaging systems for viewing the surgical field. Development of stereo video visualization systems utilizing compact high resolution mobile displays. Development of robotic microsurgery system. Development of micro laser tools for eye surgery. Development of real time optical coherence tomography system for inter-operative imaging. Management of engineering staff, outside services firms and consultants. Intellectual Property "All Star" 2014 and 2015.

### **2011-2012 PROFUSA** *Senior Director of Optical Engineering*

Development of new optical technology for glucose sensing. Design and development of compact optical system for detection of trans dermal optical fluorescence signals. Development of numerical algorithms for detecting low signal levels from tissue. Numerical modeling of light propagation in tissue. Development and testing of lanthanide based nanoparticle systems for reference signals. Time gated imaging systems for detection of low level fluorescence signals.

### **2009-2012 Laser Biopsy Inc.** *Founder and Vice President of Engineering*

Development of new multi-photon microscopy technology for imaging. Development of curved surface image plane correction algorithms. Principle Investigator of SBIR Program. Zemax modeling of microscope systems with custom aspheric lens design. Worked with teams of consultants and vendors, lead hardware and optics development. Electronic system design and software development including custom application for image acquisition. Development of tissue sample preparation systems.

### **1998-2005 Cepheid** *Director Optical and Electrical Engineering*

Management of optical and electrical staff. New product research and development in an ISO and FDA environment. Development of the GeneXpert and SmartCycler platforms, including the core optical detection system. Director of 3 million dollar DARPA contract for new micro-fluidics technology. Development and validation of manufacturing test systems for optical subsystem. Specification and validation of spectrofluorometers used in analysis of incoming biological materials. Development of data analysis techniques for correction factors used in DNA detection. Research on new fluorescent technologies including quantum dots, new fluorescent dyes and rare earth glasses. Research on micro-channel fluidic systems including of optical detection techniques.

**1994-1998 Inviso (formerly Siliscape Inc.) Manager of Optical Design**

Design and development of high-resolution virtual image display systems. Customer demonstrations and marketing. Design of the optical system used in the Inviso display product. Management of engineering consultants on optical, ASIC, and mechanical programs. Development of high volume plastic optical components. Development of electronic control systems and software for custom display ASIC. Design of compact laser illumination technologies. Research on new display technologies including deformable silicon micro-mirror, new liquid crystal technologies, OLEDs, and scanned laser systems. Start-up business development including; technical input into business plan, co-author of Inviso's patents, analysis of existing intellectual property, venture fund money raising activities.

**1994-1999 Optical Physics Consulting Consultant for optics, lasers, and display systems**

Development of laser and optical system used in texturing of hard disk. Development of virtual panoramic display concepts. Design of medical laser resonators and analysis of thermal lensing. Development of laser marking application for agricultural seed production. Development of high power laser fiber optical couplers. Development of IR detection systems for computer systems.

**1992-1994 Lockheed Missiles and Space Company, RD&D Research Scientist**

Design of eye-safe lasers for coherent laser radar. Analyzed coherent single mode fiber optic receivers. Flight testing of LIDAR system on NASA 727 airplane. System performance characterization including environmental, vibration and shock.

**1988-1992 Spectra-Physics Lasers Product Manager**

Product management for scientific diode pumped laser products. Conducted technical sales support for both customers and the field sales organization. Analyzed markets and product costs for several laser products. Managed a laboratory for testing of customer applications.

**Research Scientist:**

Development of high power laser diodes including mounting and collimation technologies. Developed a diode pumped injection seeder product for q-switched Nd:YAG lasers. Led the development program for the injection seeder product from fundamental research, through product engineering and transfer to manufacturing. Conducted research programs on single mode fiber coupled lasers. Conducted materials studies for new 1.5, 2 and 3 micron lasers.

**1986-1988. Naval Research Laboratory, Washington, DC**

**Sachs/Freeman Associates, Landover, MD Research Scientist:**

Research on the spectroscopy and laser performance of diode pumped, solid-state lasers. Mounting and collimation of pulsed high power laser diodes. Demonstrated the first diode-pumped laser emission in thulium doped materials at 2.0 and 2.3 microns. Demonstrated the first diode-pumped laser emission in erbium doped materials at 2.8 and 1.73 microns.

**Education:**

Masters of Science in Physics, University of Colorado, Boulder, CO, 1985.

B.S. in Physics with Highest Honor, Georgia Institute of Technology, Atlanta, GA, 1983.

**Memberships:**

Optical Society of America, SPIE, and Society for Information Display.

ANSI Laser Safety Training

## Intellectual property

### Patent List

8,687,294- Recessed optical surfaces  
8,591,501- Coherent fiber bundle system and method for ophthalmic intervention  
8,303,866- Mass production of micro-optical devices, corresponding tools, and resultant structures  
8,189,277- Recessed optical surfaces  
6,940,598- Multi-channel optical detection system  
6,603,443- Compact display system controlled by eye position sensory system  
6,433,935- Display illumination system  
6,404,557- Display illumination system  
6,369,893- Multi-channel optical detection system  
6,275,714- Phone with ergonomic virtual image display  
6,191,759- Virtual reality system with a static light emitting surface and magnifying optical system  
6,118,414- Virtual reality system and method  
6,094,181- Miniature synthesized virtual image electronic display  
6,055,110- Compact display system controlled by eye position sensor system  
5,991,084- Compact compound magnified virtual image display with a reflective/transmissive optic  
5,973,845- Miniature synthesized virtual image electronic display  
5,959,781- Optical method employing total internal reflection  
5,905,478- Twice folded compound magnified virtual image electronic display  
5,892,624- Compact display system with two stage magnification and immersed beam splitter  
5,870,068- Twice folded compound magnified virtual image electronic display  
5,838,498- Miniature synthesized virtual image electronic display  
5,771,124- Compact display system with two stage magnification and immersed beam splitter  
5,754,212- Resistive heating technique for creating patterned ornaments  
5,684,497- Twice folded compound magnified virtual image electronic display  
5,644,323- Miniature synthesized virtual image electronic display  
5,625,372- Compact compound magnified virtual image electronic display  
5,351,121- Solid-state laser Fourier-Transform Raman Spectrometer  
5,038,353- Method and apparatus for lasing  
5,014,279- Laser diode pumped, erbium-doped, solid state laser with high slope efficiency  
4,942,582- Single frequency solid state laser

### In Process Applications

20150335480 Apparatus and method for a global coordinate system for use in robotic surgery  
20150119637 System for robotic-assisted endoluminal surgery and related methods  
20150051592 Method and apparatus for laser assisted cataract surgery  
20140364870 Method, apparatus, and a system for robotic assisted cataract surgery  
20140364707 Apparatus and methods for detecting optical signals from implanted sensors  
20140275869 Method and device for correcting optical signals